

CLAIMS

- 1) A data network comprising a provider node, a receiver node, and a plurality of intermediate nodes, the provider node being arranged to provide data to at least one of
5 said intermediate nodes or to the receiver node, said intermediate nodes being arranged to receive data and forward data to at least one other intermediate node or to the receiver node, and the receiver node being arranged to receive data from at least one intermediate node or from the provider node; wherein:
said data comprises at least a part which relates to a path characterisation
10 metric;
said provider node is arranged to assign an initial condition to the path characterisation metric in respect of data provided by it;
said intermediate nodes are arranged to update the condition of the path characterisation metric in respect of data they forward;
15 said receiver node is arranged to make available for the provider node information indicative of a discrepancy between the condition of the path characterisation metric in respect of data received by it and a predetermined target condition for the path characterisation metric; and wherein
said provider node is arranged to assign a different initial condition to the path
20 characterisation metric in respect of subsequent data provided by it in the event that it receives information indicative of such a discrepancy from said receiver node.
- 2) A data network according to claim 1, wherein the condition of the path characterisation metric at a node is indicative of a measure of congestion expected to be
25 experienced by data on a path downstream of that node.
- 3) A data network according to claim 1, wherein the condition assigned to the path characterisation metric is a value, and the predetermined target condition is a value.
- 30 4) A data network according to claim 1, wherein in the event that said provider node assigns a different initial condition to the path characterisation metric in respect of subsequent data provided by it, said different initial condition is assigned such as to decrease a corresponding discrepancy in respect of said subsequent data received by said receiver node.

- 5) A data network according to claim 4, wherein said different initial condition is assigned such as to maximise the possibility that said corresponding discrepancy in respect of said subsequent data received by said receiver node will be zero.
- 5 6) A data network according to claim 1, wherein an intermediate node is arranged to update the condition of the path characterisation metric in response to a path characteristic associated with that node.
- 7) A data network according to claim 6, wherein said path characteristic relates to a
10 measure of congestion on a path associated with that node.
- 8) A data network according to claim 6 or 7 wherein said path characteristic relates to a measure of congestion on a path downstream of that node.
- 15 9) A method for assigning path characterisation metrics to data in a data network comprising a provider node, a receiver node, and a plurality of intermediate nodes, the provider node being arranged to provide data to at least one of said intermediate nodes or to the receiver node, said data comprising at least a part which relates to a path characterisation metric, said intermediate nodes being arranged to receive data and
20 forward data to at least one other intermediate node or to the receiver node, and the receiver node being arranged to receive data from at least one intermediate node or from the provider node; the method comprising steps of:
- assigning an initial condition to the path characterisation metric in respect of data provided by the provider node;
- 25 updating the condition of the path characterisation metric in respect of data forwarded by said intermediate nodes;
- monitoring a final condition of the path characterisation metric in respect of data received by the receiver node, and determining a measure indicative of a discrepancy between said final condition and a predetermined target condition for the path
30 characterisation metric; and
- assigning a different initial condition to the path characterisation metric in respect of subsequent data provided by the provider node in the event that said measure indicates such a discrepancy in respect of previous data.

10) A method according to claim 9, wherein the condition assigned to the path characterisation metric is a value, and the predetermined target condition is a value.

11) A feedback node for enabling an initial condition to be assigned to a path characterisation metric in respect of data to be forwarded through a data network, said data network comprising a provider node, a receiver node and a plurality of intermediate nodes, said data comprising at least a part which relates to a path characterisation metric; said provider node being arranged to assign an initial condition to the path characterisation metric in respect of data, and to provide said data to at least one of said intermediate nodes or to the receiver node; said intermediate nodes being arranged to receive data from said provider node or from one or more other intermediate nodes, to update a condition of the path characterisation metric in respect of data received by them, and to forward data to at least one other intermediate node or to the receiver node; and said receiver node being arranged to receive data from at least one intermediate node or from the provider node, and to make available for the feedback node information relating to the path characterisation metric in respect of data received by it; wherein

the feedback node is arranged to enable a different initial condition to be assigned to the path characterisation metric in respect of subsequent data provided by the provider node in the event that said feedback node receives information indicative of a discrepancy between a predetermined target condition for the path characterisation metric and the condition of the path characterisation metric in respect of previous data received by said receiver node.

12) A feedback node according to claim 11, wherein the condition assigned to the path characterisation metric is a value, and the predetermined target condition is a value.

13) A feedback node according to claim 11 or 12, wherein in the event that a different initial condition is assigned to the path characterisation metric in respect of subsequent data, said different initial condition is assigned such as to decrease a corresponding discrepancy in respect of said subsequent data received by said receiver node.

14) A feedback node according to any of claims 11 to 13, said feedback node also serving as said provider node in said network.

15) A feedback node according to claim 14, said feedback node being arranged to assign a different initial condition to the path characterisation metric in respect of subsequent data in the event that it receives, from said receiver node, a measure of a discrepancy between said predetermined target condition for the path characterisation
5 metric and the condition of the path characterisation metric in respect of previous data received by said receiver node.

16) A feedback node according to claim 14, said feedback node being arranged to assign a different initial condition to the path characterisation metric in respect of
10 subsequent data in the event that it receives, from said receiver node, information indicative of the condition of the path characterisation metric in respect of previous data received by said receiver node, and determines that there is a discrepancy between said condition of the path characterisation metric and said predetermined target condition for the path characterisation metric.

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17) A feedback node according to any of claims 11 to 13, said feedback node also serving as said receiver node in said network.

18) A feedback node according to claim 17, said feedback node being arranged to
20 make available for the provider node a measure of a discrepancy between said predetermined target condition for the path characterisation metric and the condition of the path characterisation metric in respect of previous data received by said receiver node, whereby to enable said provider node to assign a different initial condition to the path characterisation metric in respect of subsequent data.

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19) A feedback node according to claim 17, said feedback node being arranged to make available for the provider node information indicative of the condition of the path characterisation metric in respect of previous data received by said receiver node, whereby to enable said provider node to assign a different initial condition to the path
30 characterisation metric in respect of subsequent data in the event that said provider node determines that there is a discrepancy between said condition of the path characterisation metric and said predetermined target condition for the path characterisation metric.

20) A method of providing data in a data network comprising a provider node, a receiver node and a plurality of intermediate nodes, the provider node being arranged to provide data to at least one of said intermediate nodes or to the receiver node, said data comprising at least a part which relates to a path characterisation metric; said
5 intermediate nodes being arranged to receive data from said provider node or from one or more other intermediate nodes, to update a condition of the path characterisation metric in respect of data received by them, and to forward data to at least one other intermediate node or to the receiver node; and said receiver node being arranged to receive data from at least one intermediate node or from the provider node, and to make available for the
10 provider node information indicative of a discrepancy between an eventual condition of the path characterisation metric in respect of data received by it and a predetermined target condition for the path characterisation metric; the method comprising the steps of:

assigning an initial condition to the path characterisation metric in respect of data;
providing said data to at least one of said intermediate nodes;

15 receiving information relating to said eventual condition of the path characterisation metric in respect of previously-provided data received by said receiver node; and

assigning a different initial condition to the path characterisation metric in respect of subsequent data in the event of receipt of information indicative of a discrepancy
20 between said eventual condition of the path characterisation metric and a predetermined target condition for the path characterisation metric.

21) A method according to claim 20, wherein the condition assigned to the path characterisation metric is a value, and the predetermined target condition is a value.

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22) A method according to claim 20 or 21, said receiver node being arranged to make available for the provider node a measure of a discrepancy between said predetermined target condition for the path characterisation metric and said eventual condition of the path characterisation metric in respect of previous data received, whereby
30 to enable said provider node to assign a different initial condition to the path characterisation metric in respect of subsequent data.

23) A method according to claim 20 or 21, said receiver node being arranged to make available for the provider node information indicative of the condition of said
35 eventual path characterisation metric in respect of previously received data, whereby to

enable said provider node to assign a different initial condition to the path characterisation metric in respect of subsequent data in the event that said provider node determines that there is a discrepancy between said condition of the path characterisation metric and said predetermined target condition for the path characterisation metric.

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24) A method for providing path characterisation information for nodes in a network, said network comprising a plurality of nodes including a provider node, a receiver node, and at least one intermediate node, the provider node being arranged to provide data to at least one intermediate node or to the receiver node, an intermediate node being arranged
10 to receive data and to forward data to at least one other intermediate node or to the receiver node, and the receiver node being arranged to receive data from the provider node or from at least one intermediate node; the method comprising steps of:

assigning an initial condition to a path characterisation metric in the event that said provider node provides data, said path characterisation metric being associated with
15 said data;

updating the condition of the path characterisation metric in the event that an intermediate node receives said data;

determining an eventual condition of the path characterisation metric in the event that said receiver node receives said data; and

20 establishing if a discrepancy exists between the eventual condition of the path characterisation metric and a predetermined target condition;

wherein, in the event that it is established that a discrepancy does exist between said eventual condition and said predetermined target condition, said method further comprises steps of:

25 assigning a different initial condition to a further path characterisation metric in the event that said provider node subsequently provides further data, said further path characterisation metric being associated with said further data;

updating the condition of said further path characterisation metric in the event that an intermediate node receives said further data; and

30 making information indicative of said updated condition available to said intermediate node.

25) A method according to claim 24, wherein the condition assigned to the path characterisation metric is a value, and the predetermined target condition is a value.

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26) A method for providing path characterisation information for nodes in a network, said network comprising a plurality of nodes including a provider node, a receiver node, and at least one intermediate node, the provider node being arranged to provide data to at least one intermediate node or to the receiver node, an intermediate node being arranged
5 to receive data and to forward data to at least one other intermediate node or to the receiver node, and the receiver node being arranged to receive data from the provider node or from at least one intermediate node; the method comprising steps of:

assigning an initial condition to a path characterisation metric in the event that said provider node provides data, said path characterisation metric being associated with
10 said data;

updating the condition of the path characterisation metric in the event that an intermediate node receives said data;

determining an eventual condition of the path characterisation metric in the event that said receiver node receives said data; and

15 establishing if a discrepancy exists between the eventual condition of the path characterisation metric and a predetermined target condition;

wherein, in the event that it is established that a discrepancy does exist between said eventual condition and said predetermined target condition, said method further comprises steps of:

20 assigning an initial condition to a further path characterisation metric in the event that said provider node subsequently provides further data, said further path characterisation metric being associated with said further data;

updating the condition of said further path characterisation metric in the event that an intermediate node receives said further data;

25 making information indicative of said updated condition available to said intermediate node; and

making information relating to the discrepancy between the eventual condition of a previous path characterisation metric and said predetermined target condition available to said intermediate node.

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27) A method according to claim 26, wherein the condition assigned to the path characterisation metric is a value, and the predetermined target condition is a value.

28) A path characterisation system for providing path characterisation information in
35 association with a data network, said data network comprising a plurality of nodes

including a provider node, a receiver node, and at least one intermediate node, the provider node being arranged to provide data to at least one intermediate node or to the receiver node, an intermediate node being arranged to receive data and to forward data to at least one other intermediate node or to the receiver node, and the receiver node being
5 arranged to receive data from the provider node or from at least one intermediate node; the path characterisation system comprising:

a path characterisation metric condition assigning means, associated with the provider node, arranged to assign an initial condition to a path characterisation metric in the event that said provider node provides data;

10 a path characterisation metric updating means, associated with an intermediate node, arranged to update the condition of the path characterisation metric in the event that said node receives data; and

a path characterisation metric feedback means, associated with the receiver node, arranged to determine an eventual condition of the path characterisation metric in
15 the event that said receiver node receives said data, and to make available for the path characterisation metric condition assigning means information indicative of a discrepancy between the eventual condition of the path characterisation metric and a predetermined target condition for the path characterisation metric; wherein

said path characterisation metric condition assigning means is arranged to assign
20 a different initial condition to a path characterisation metric associated with subsequent data in the event that feedback is made available indicative of such a discrepancy between the eventual condition of the path characterisation metric and the predetermined target condition in relation to a previous path characterisation metric.

25 29) A path characterisation system according to claim 28, wherein the condition assigned to the path characterisation metric is a value, and the predetermined target condition is a value.

30 30) A path characterisation system for providing path characterisation information in association with a data network, said data network comprising a plurality of nodes including a provider node, a receiver node, and at least one intermediate node, the provider node being arranged to provide data to at least one intermediate node or to the receiver node, an intermediate node being arranged to receive data and to forward data to at least one other intermediate node or to the receiver node, and the receiver node being

arranged to receive data from the provider node or from at least one intermediate node;
the path characterisation system comprising:

a path characterisation metric condition assigning means, associated with the provider node, arranged to assign a path characterisation metric with an initial condition in
5 the event that said provider node provides data, said path characterisation metric being associated with said data;

a path characterisation metric updating means, associated with a node capable of receiving data, arranged to update the condition of the path characterisation metric in the event that said node receives data; and

10 a path characterisation metric feedback means, associated with the receiver node, arranged to determine an eventual condition of the path characterisation metric in the event that said receiver node receives said data, and to make available for the path characterisation metric condition assigning means information relating to the eventual condition of the path characterisation metric; wherein

15 said path characterisation metric condition assigning means is arranged to provide information relating to the eventual condition of the path characterisation metric associated with previous data in the event that feedback is made available indicative of such a discrepancy between the eventual condition of the path characterisation metric and the predetermined target condition in relation to a previous path characterisation metric.

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31) A path characterisation system according to claim 30, wherein the condition assigned to the path characterisation metric is a value, and the predetermined target condition is a value.